

CLAIMS

1. A plurality of transmission apparatuses each of which functions as a sending side transmission apparatus and a destination transmission apparatus; each of said
5 plural transmission apparatuses being connected to terminals through an asynchronous network; said plural transmission apparatuses being interconnected through plural transmission lines each formed by a synchronous network; asynchronous data from one of said terminals
10 being transmitted from said sending side transmission apparatus to said plural transmission lines after simultaneous conversion from said asynchronous data to synchronous data; said destination transmission apparatus selecting one of plural reception lines of said
15 synchronous network; and said destination transmission apparatus converting said synchronous data to said asynchronous data and transmitting said asynchronous data to one of terminals through said asynchronous network; each of said transmission apparatuses comprising:
20 a means for selecting one of reception lines each formed by said synchronous network;
a means for transmitting a communication confirming frame to said synchronous network at least at a predetermined period;
25 a communication confirming table for storing each reception time of said communication confirming frame received through said synchronous network, corresponding to each of said reception lines; and
30 a means for deciding occurrence of failure on said reception line corresponding to said reception time when a difference between a reception time stored in said table and a present time at said predetermined period exceeds a predetermined value, and transmitting
35 instructions of switching said reception line to said reception line selecting means.

2. A plurality of transmission apparatuses each of

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which functions as a sending side transmission apparatus
and a destination transmission apparatus; each of said
plural transmission apparatuses being connected to
terminals through an asynchronous network; said plural
5 transmission apparatuses being interconnected through
plural transmission lines each formed by a synchronous
network; asynchronous data from one of said terminals
being transmitted from said sending side transmission
apparatus to said plural transmission lines after
10 simultaneous conversion from said asynchronous data to
synchronous data; said destination transmission apparatus
selecting one of plural reception lines of said
synchronous network; and said destination transmission
apparatus converting said synchronous data to said
15 asynchronous data and transmitting said asynchronous data
to one of terminals through said asynchronous network;
each of said transmission apparatuses comprising:

a terminal identifying and learning table
for extracting a sending side terminal identifying
20 information of said asynchronous data from said terminal,
and for storing extracted said sending side terminal
identifying information with a reception time of said
extracted sending side terminal identifying information;

a means for transmitting contents of said
25 terminal identifying and learning table to all
transmission apparatuses connected to said synchronous
network using said terminal identifying and informing
frame; and

a transmission apparatus identifying and
30 learning table for storing said terminal identifying
information of the contents of said terminal identifying
and informing frame received from said synchronous
network, corresponding to said sending side transmission
apparatus of said terminal identifying and informing
35 frame, and for learning terminal identifying information
connected to each transmission apparatus.

3. A transmission apparatus as claimed in claim 2,

further comprising:

a means for transmitting said terminal identifying and informing frame to said synchronous network at least at a predetermined period;

5 a communication confirming table for storing a reception time corresponding to each of said reception lines of said terminal identifying and informing frame received through said synchronous network; and

10 a means for deciding occurrence of failure on said reception line corresponding to said reception time when a difference between a reception time stored in said table and a present time at said predetermined period exceeds a predetermined value, and transmitting
15 instructions of switching said reception line to said reception line selecting means.

4. A method for transmitting data in a data transmission system which is structured by a plurality of transmission apparatuses each of which functions as a
20 sending side transmission apparatus and a destination transmission apparatus; each of said plural transmission apparatuses being connected to terminals through an asynchronous network; said plural transmission apparatuses being interconnected through plural
25 transmission lines each formed by a synchronous network; asynchronous data from one of said terminals being transmitted from said sending side transmission apparatus to said plural transmission lines after simultaneous conversion from said asynchronous data to synchronous
30 data; said destination transmission apparatus selecting one of plural reception lines of said synchronous network; and said destination transmission apparatus converting said synchronous data to said asynchronous data and transmitting said asynchronous data to one of
35 terminals through said asynchronous network; said method comprising steps of:

transmitting a communication confirming

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frame from one of said transmission apparatus to said synchronous network at least at a predetermined period;

storing a reception time of said communication confirming frame corresponding to said reception line in said transmission apparatus which received said communication confirming frame;

comparing a reception time of said communication confirming frame stored in said table at a predetermined period and corresponding to said reception line, with a present time; and

deciding occurrence of failure on said reception line corresponding to said reception time when a difference between said reception time and said present time exceeds a predetermined value, and controlling a reception line selecting means so as to select a normal reception line.

5. A method for transmitting data in a data transmission system which is structured by a plurality of transmission apparatuses each of which functions as a sending side transmission apparatus and a destination transmission apparatus; each of said plural transmission apparatuses being connected to terminals through an asynchronous network; said plural transmission apparatuses being interconnected through plural transmission lines each formed by a synchronous network; asynchronous data from one of said terminals being transmitted from said sending side transmission apparatus to said plural transmission lines after simultaneous conversion from said asynchronous data to synchronous data; said destination transmission apparatus selecting one of plural reception lines of said synchronous network; and said destination transmission apparatus converting said synchronous data to said asynchronous data and transmitting said asynchronous data to one of terminals through said asynchronous network; said method comprising steps of:

extracting sending side terminal

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identifying information of said asynchronous data from one of said terminal, and storing extracted said information in a terminal identifying and learning table;

transmitting contents of said terminal
5 identifying and learning table to all transmission apparatuses connected to said synchronous network using a terminal identifying and informing frame;

storing said terminal identifying
information of the contents of said terminal identifying
10 and informing frame received through said synchronous network in a transmission apparatus identifying and learning table, corresponding to said sending side transmission apparatus of said terminal identifying and informing frame; and

15 adding a destination apparatus identifying information based on said identifying information of said terminal referring to said learning table, to said asynchronous data from said terminal through said asynchronous network, and transmitting said destination
20 apparatus identifying information to said synchronous network.

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